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**(54) PRODUCTION OF ULTRAVIOLET  
LASER-RESISTANT OPTICAL MEMBER**

(57) Abstract:

**PURPOSE:** To more stably obtain an ultraviolet laser-resistant optical member excellent in laser resistance by suppressing the dispersion in development of paramagnetic defects in irradiation with the laser in ultraviolet laser-resistant quartz glass containing hydrogen in synthetic quartz glass produced by a soot method as a starting preform.

**CONSTITUTION:** This method for producing an ultraviolet laser-resistant quartz glass member comprises the steps of carrying out the transparent vitrification of a porous silica preform under a high vacuum

of  $\approx 1 \times 10^{-2}$  Torr and producing a starting preform; and keeping the resultant starting preform at a temperature in the region of 300-600°C in a hydrogen-containing atmosphere and including hydrogen at  $\approx 1 \times 10^{17}$  molecules/cm<sup>3</sup> concentration therein in a method for subjecting a volatile silicon compound to the flame hydrolysis, depositing the formed fine silica particles on a rotating substrate, constituting the porous silica preform, then transparently vitrifying the porous silica preform, providing synthetic quartz glass, using the prepared synthetic quartz glass as the starting preform and producing the ultraviolet laser-resistant optical member.

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